

Visitor Access and Transportation Guide

U.S. Department of the Interior



Yosemite National Park sign and trails
Source: Volpe Center photographs (June 2010)

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Introduction to study

This visitor access and transportation guide presents opportunities to manage or improve circulation and travel patterns in areas managed by Federal Land Management Agencies (FLMAs), such as the National Park Service (NPS), U.S. Forest Service (USFS), Bureau of Land Management (BLM), and U.S. Fish and Wildlife Service (FWS). Transportation is only one element of visitor use management and should be considered in conjunction with cultural and environmental resource protection objectives and comprehensive long-range plans. Transportation strategies may both conventional transportation infrastructure as well as alternative transportation systems, such as shuttle bus systems. Depending on the circumstances of individual units, however, small-scale strategies, such as improvements at site entrances and visitor stations, and along roadways, parking areas, trailheads, and pull-offs, may be better suited to address specific visitor use management needs.

This guide provides examples of transportation strategies that vary in cost, scale, and transportation need as well as the lessons learned from past applications of different transportation measures. Through the implementation of these strategies, land managers may avoid or defer the expense and time commitment required for a large infrastructure project.

Overview

The guide identifies initial information and important considerations concerning visitor access strategies that may, in the long run, be more appropriate than elaborate and costly alternative transportation projects. Large scale transportation infrastructure may remain necessary for the long-term; however, strategies in the guide are intended to be feasible for the short-term, low in cost, or part of a suite of management strategies to improve visitor access. The report is divided into four parts:

- *Background:* Explains what visitor access strategies are and how they can be applied effectively in FLMAs.
- *Strategies:* Listing of strategies to improve visitor access and transportation.
- *Application and Implementation:* Guide to implement and make the best use of the strategies.
- *Access and Transportation Case Studies:* Examples of strategies to improve visitor access and reduce congestion, in FLMA units, or similar sites.

The project team gathered background information on access strategies from literature, case studies, and discussions with FLMA staff. Additional input was provided by an interagency visitor use group.

Congestion on Federal Lands

Vehicle and pedestrian congestion is a common concern for FLMA staff within their unit or region. In this report, congestion refers to a variety of conditions, such as crowds moving through a visitor center, an overflow of pedestrians or bicyclists on a trail or at a trailhead, vehicles circling in a parking lot, and tour buses waiting at an entry gate. According to NPS, primary transportation challenges include limited access to a site, roadway congestion, limited alternatives to private vehicle use, and insufficient or inadequate parking.¹ See the table below for mode and location examples.

¹ National Park Service and Parsons Brinkerhoff Quade & Douglas Inc. *The National Park Service Transportation Planning Guidebook*. September 1999.

Modal issues	Locations of site concerns
<ul style="list-style-type: none"> • Lack of pedestrian access • Lack of bicycle access • Lack of transit access • Vehicular congestion • Pedestrian congestion • Transit congestion • Multi-modal conflict 	<ul style="list-style-type: none"> • Entrance gate • Trailhead • Visitor center parking lot • Access road • FLMA unit road • Bicycle lanes • Pedestrian walkways • Internal trails • Attractions

Prior to implementing a strategy to reduce congestion and improve access, the unit should assess its current conditions to identify the leading causes of congestion. Common reasons for congestion are identified below in terms of the locations where they occur.

At Entrance Booths

- Payment methods: It takes three times as long to process a credit card payment than to accept cash.² Previously purchased passes require only a few seconds to process, and these can also be used in an automated line. Speed of entry for automated entrance station varies by technology type.
- Questions for visitor-services staff: While rangers and other visitor staff want to be available to assist visitors and answer questions, there are opportunities to provide basic information ahead of time, rather than addressing questions at the entrance gates. Basic information can be posted on signs early on to prepare visitors, or the unit can encourage visitors with questions to visit a visitor center rather than ask questions at the gate.

On Trails

- Visitors may crowd around specific attractions or interpretive signs.
- Visitors may stick to one or a few popular trails, avoiding other less congested trails.
- Strollers and small children: Families and people pushing strollers (especially double-wide strollers) may increase congestion along paths.

In Parking Lots

- Parking lots may reach capacity and visitors may drive around for long periods of time waiting for a spot.
- Parking lots may reach capacity and visitors may not be aware of overflow parking lots.
- Parking lots may not be full, but it may be unclear where available parking spots are, or additional lots.

It is also important to consider trends in visitation. According to a 2002 report by the National Park Service, many visitors have moved from visiting a single unit to “park chaining,” or visiting several units over the same period of time, which has impacts for traffic congestion. Day trips are also becoming more common. The report also shows that international visitors are shifting from traveling in organized tour groups to more individualized travel, often in a private car.³

Congestion will vary from site to site and throughout the year. Congestion levels that might be acceptable to land managers and visitors at an urban site or along a main roadway may be unacceptable at a rural site or at a trailhead. Visitor and staff acceptance of crowding can depend on several variables. Robert Manning, Professor of Natural

² Upchurch, Jonathan, *Service Times And Capacity At National Park Entrance Stations*. 2005

³ Van Doren, Amy. *National Park Service Looks at Transit to Reduce Environmental Impacts of Increased Visitors*. Tech Transfer. University of California Berkeley, 2002.

Resources and Director of the Park Studies Lab at the University of Vermont, identified several factors that influence a visitor's perception of crowding.⁴

- *Visitor characteristics*: preference, expectations, experience, attitude, and demographics.
- *Characteristics of those encountered*: type and size of group, behavior, perceptions of likeness.
- *Situational variables*: type of area, location within an area, and environmental factors.

In addition to effects on visitor perceptions, crowding and congestion can cause serious adverse impacts to natural resources. Examples of negative impacts include:⁵

- *Vegetation damage and soil erosion*: Vehicles and pedestrians can impact natural resources along roads, parking lots, and trails when they park or walk in undesigned areas.
- *Pollution*: Vehicle congestion can result in pollution both within FLMA units and in nearby gateway communities.
- *Unsafe conditions for wildlife*: Vehicle congestion and loss of habitat impacts the ability for wildlife to move and forage.

Figure 1
Congestion in public lands: Mendenhall Glacier Visitor Center, Tongass National Forest (left), Grand Canyon National Park (center), and Santa Ana National Wildlife Refuge (right)

Source: Volpe Center



To decrease congestion, a popular solution is the implementation of a shuttle service or an expansion of existing parking capacity. Such infrastructure projects and new alternative transportation systems are expensive and time-consuming, and may negatively impact natural resources on a site or the visitor experience. Alternatively, there are numerous inexpensive or short-term solutions that decrease congestion and can be beneficial in protected areas.

Visitor Access and Transportation Management

Visitors are influenced in where they go and what they do by federal land management staff, maps, signage, and guidebooks that suggest the most popular destinations or identify top site attractions. Visitors often have limited time at a site or arrive with limited information. Consequently, visitors often go where they are directed or where they see other visitors, even though they may be guided towards popular activities and well-known destinations without regard to congestion issues. While a site may include numerous vantage points, views, and trails, site resources frequently have uneven use. This may be an intentional management decision for FLMA units that wish to preserve sensitive areas. Alternatively, units may wish to redistribute or inform visitors of other options.

⁴ Manning, Robert. *Studies in Outdoor Recreation*. Oregon State University Press. 1999.

⁵ Anderson, Dorothy H, David W. Lime, and Theresa L. Wang. *Maintaining the Quality of Park Resources and Visitor Experiences: A Handbook for Managers*. University of Michigan Extension. September 1998.

Without strategies to adequately manage visitor access to conserve resources and enhance the visitor experience, visitors may not make use of a site’s amenities and congestion may occur near visitor centers, at trailheads, and near site attractions. Visitor access solutions to these problems include designation of trails, signage, and traffic management.

Implementation of visitor access strategies can produce a range of benefits. Not only can access strategies improve the condition of natural resources and the visitor experience, they can also improve relationships among stakeholders, initiate local partnerships, and limit unnecessary infrastructure projects. FLMAs that decrease congestion along access roads and into gateway communities can improve relationships with surrounding businesses and land owners. To improve access and circulation, FLMA staff would benefit from tools, programming, or management strategies that help move visitors through a space and inform them of their options.

Visitor Access and Transportation Management Strategies

There are several types of transportation strategies that can improve congestion and visitor access within FLMA units. FLMA units follow different management priorities, have diverse resources, provide various visitor experiences, and have unique visitation levels and patterns. The appropriate management strategy will vary for each site.

Transportation management strategies may be either direct or indirect. Direct management practices include regulation or restrictions placed on visitors. Indirect management practices include changes to the planning, education, and infrastructure to influence visitor behavior or provide alternative opportunities for site access. FLMA staff can test best practices or combine strategies based on the current need. Management strategies can be implemented throughout the year or during peak visitor seasons based on visitation, visitor experience or resource needs.

The transportation strategies that improve visitor access and circulation can be grouped into four categories: access limitation, visitor information, alternative modes of access, technology and traffic management (Figure 1). The sources of this information are FLMA interviews and a National Park Service report⁶ to highlight transportation related strategies. Techniques can be used alone or in combination with other strategies.

Figure 1
Visitor Access Strategies
Source: Volpe Center



⁶ Anderson, Dorothy H, David W. Lime, and Theresa L. Wang. *Maintaining the Quality of Park Resources and Visitor Experiences: A Handbook for Managers*. University of Michigan Extension. September 1998.

Access limitation

Access limitation refers to regulations to control the level access into or around an FLMA unit. Access limitation can improve circulation, congestion, and overuse on roadways and parking lots. Strategies can also improve relations in surrounding gateway communities with less congestion and pollution.

Different types of visitors will react differently to access restrictions. Visitors with flexibility in their itineraries will generally be more accepting of limitations that may increase the length of time needed to visit a site, but will improve the visitor experience overall. FLMAs should work with visitors and key stakeholders before implementing any access restrictions. Visitors may be more likely to accept restrictions if they are provided adequate information about the reason for the restrictions.

Access limitation examples include:

- Roadway closure;
- Limitation on mode type;
- Shuttle services;
- Reservation systems;
- Timed entrances; and
- Capacity limits in target areas.

Visitor information

Visitor information refers to data available to visitors to make decisions regarding their visit. There are several methods that FLMA staff use to update and disseminate visitor information so that it reaches all visitor types. FLMA staff should consider strategies to provide information to visitors prior to arrival and information at the site itself. By providing helpful trip planning information to visitors prior to arrival, FLMA staff may be able to answer questions or help visitors make decisions before they arrive onsite. FLMA staff members are an essential element of the interpretive experience; however, they often can avoid having to provide basic logistical information if this is adequately provided to visitors prior to arrival.

Signage and wayfinding materials can provide information to help visitors better understand the unit's trails and attractions. Descriptions of trail difficulty or distances between sites, for example, can help visitors make important decisions about their path. Physical signs or multimedia applications such as audio tours, hotlines, and smart phone applications are some examples of visitor information tools.

Additionally, FLMA staff can encourage visitors to the FLMA unit during off-peak periods, encourage use of alternative modes of travel, or encourage visitors to visit less congested areas within the unit, each of which can reduce visitor congestion. By providing the visitor with positive messages, such as referring to underutilized areas or trails as "areas yet to be explored," the visitor may be more likely to follow these suggestions.

Visitor information examples include:

- Suggestions and incentives for trip or arrival time;
- Guidance on wayfinding and general directions;
- Trip planning tools;
- Advisory messages;
- Educational maps, brochures, newspapers, or online;
- Cell phones or radio broadcast tours;
- Podcasts; and
- Information or incentives to visit during non-peak times.

Alternative modes of access

Alternative modes of access refer to the accessibility of an FLMA unit by a nonmotorized method of travel or by public transportation. FLMA units can encourage pedestrian, bicycle, and boater access with infrastructure, trails, signage, and maps. In the case of existing infrastructure, FLMAs can make enhancements to encourage visitors to use these modes.

Alternative modes of access examples include:

- Bicycle lanes;
- Pedestrian walkways;
- Multi-use trails;
- Water trails and entry/exit points;
- Connection to regional trails;
- Rental facilities and partnerships with local rental companies;
- Shuttle bus interpretive tours; and
- Transit.

Technology and traffic management

In this context, Intelligent Transportation Systems (ITS) refers to the use of technology to gather and communicate up to date site information that can improve the unit's ability to communicate during a road closure, storm event, or natural disaster. Technologies can also be used to collect visitor data and inform visitors of accurate parking availability or shuttle service locations.

Traffic management refers to activities or infrastructure design that can be used to manage parking lots, roadways, and intersections when there is congestion or a special event.

Traffic management strategies and principles can be applied to nonmotorized trails as well as motorized roads. For example, FLMA staff can encourage visitors to travel in the same direction on loop trails to reduce traffic and congestion resulting from passing.

Technology and traffic management examples include:

- Parking lot counts or up to date display of parking availability;
- Traffic counts;
- Traveler information;
- Incident management;
- Road design;
- One-way roads;
- Weather information; and
- FLMA staff who direct vehicular traffic.

Implementation Guide

The strategies and case studies outlined in this report can be used as examples to direct an agency's congestion and access management plan. Each FLMA may have specific policies that support or conflict with the strategies. Agencies should consult with regional management prior to implementing any congestion management strategy.

While most of these examples are taken from FLMA units, there are also some examples of congestion management and visitor access improvement taken from State and city parks, international parks or recreational areas, and private facilities.

Systems Planning

Where applicable, FLMA managers should incorporate congestion management and visitor access strategies into a larger system plan. Coordination with asset management plans, infrastructure, or fee planning will reduce duplication of efforts and may also create less of an impact for visitors. For example, if the agency wants to increase nonmotorized access to the unit, the agency should review the asset management plan in order to see if there is an opportunity to construct a bike path during a road re-pavement or other scheduled improvement.

The FLMA unit should collect data on access and congestion problems and develop measures to assess the outcomes of any implemented strategies. For example, Yosemite National Park has installed vehicle counters at its entrance gates to gather information about the number of visitors and travel trends at entrances.⁷

Systems planning is especially important in addressing visitor access, as changes to one element of the unit can greatly affect other areas. For example, increasing entrance station capacity may reduce congestion at the entrance gates, but may increase congestion in the parking lots. Moving visitors to shuttle buses from private automobiles can increase initial congestion at the units if a large number of visitors arrive at the same time, rather than in dispersed intervals. Even when looking at a signage and wayfinding plan, considering how the signs will fit into the larger system is again critical for a successful visitor experience. Signage can help visitors make decisions and learn about the site; however, poorly designed signs can cause confusion, and poorly placed signs can obstruct views or create congestion.

Funding and Technical Assistance

FLMA agencies have many resources available for funding and technical assistance. Below are some key resources:

- [FHWA Office of Federal Lands Highway](#)
- [FHWA Resource Center](#)
- [Paul S. Sarbanes Transit in Parks Program](#)
- [Paul S. Sarbanes Transit in Parks Program Technical Assistance Center](#)
- [DOI Cooperative Conservation Grants](#)
- [The Rivers, Trails, and Conservation Assistance Program](#)

Partnerships

FLMA agencies can rely on other partners to assist in congestion management and access programs.

- Volunteers: Volunteer Visitor Use Assistants or Trail Assistants can help direct visitors, expedite entrance lines, and balance distribution through the unit. Volunteers or Friends groups can also assist with special events when congestion is increased.
- Gateway communities: Gateway communities can help convey important messages or support transit. Hotels especially can provide helpful information about access, including highlighting times of heavy congestion, or suggesting alternative modes of transport. For certain infrastructure improvements,

⁷ Interview with park staff.

especially those that will benefit gateway communities, city or state governments may be able to provide financial or technical assistance.

- Transit Agencies: Rather than develop and manage a shuttle system, FLMA units may be able to establish a relationship with a transit agency that can add the unit to its route, either a regular route, or extended route during peak times
- Concessionaires: Concessionaires such as tour bus operators can develop incentives to visit the unit at non-peak periods, or work with the unit to expedite bus queues or drop off times to relieve congestion. Concessionaires can also manage bike rental facilities or other ways of getting around the unit.

Strategy Charts

For purposes of this guide, improving visitor access is characterized by five goals:

1. Reducing traffic congestion;
2. Providing adequate parking;
3. Maximizing efficient use of trails;
4. Increasing use of public transportation; and
5. Reducing conflicts between visitors.

This chapter identifies specific interventions that can be performed to achieve each of these goals. These goals are first identified by the type of visitor access strategy, and evaluated by the criteria described in the following table.

<i>Strategies Evaluation Key</i>					
Evaluation	Description	Ranking type			
Strategy Type	Type of visitor access strategy	Alternatives Modes of Access	Access limitation	Visitor Information	Traffic Management and Technology
Mode	Mode (or combinations of mode)	Pedestrian	Bicycle	Automobile	Transit
Cost	Cost to unit to plan and implement the strategy	Low: \$0-\$2,000	Medium: \$2,000-\$10,000	High: Greater than \$10,000	
Staff Effort	Staff time and expertise required to plan and implement the strategy	Low: Unit can easily manage with current staff hours	Medium: Some staff may need to take on additional hours or responsibility	High: Unit will likely have to hire additional staff or contractors	
Visitor Impact	While all strategies strive to improve the visitor experience, some strategies may require some changes in the way visitors access the unit, and some of these may initially incite some negative reactions from visitors.	Positive: Some initial positive perceptions	Neutral: Not noticed by visitor	Negative: Some initial negative perceptions	
Environmental Impact	Most of the strategies in this report have low environmental impacts. This ranking describes the environmental impacts relative to other strategies in the report.	None or Low	Medium	High	

Goal 1: Reduce Traffic Congestion

Federal land units may wish to manage their visitor access through congestion reduction measures. Traffic congestion is a common problem, at one time or another, for many federal land units. The most popular of units may experience congestion on a daily basis, whereas other units may only experience congestion during peak seasons or for special events.

The following is a list of traffic congestion reduction strategies, followed by a table evaluating the relative impacts and costs associated with implementing these respective strategies. This section concludes with a series of case studies demonstrating instances of these strategies in practice today at federal lands units.

- *Reconfigure roads to one-way travel (loop).* One-way travel allows for better circulation of vehicles and reduces conflicts among them.
- *Increase/decrease site entrance fee.* Fees can be increased in times of high visitation, and decreased in times of low visitation, in order to encourage visitors to visit during off-peak times and seasons.
- *Install graduated site entrance fee (e.g., lower fee before 9 AM, after 12 PM).* Fees can also be adjusted by time of day to achieve balanced distribution.
- *Supply more alternative transportation options to site.* Alternative transportation enables many visitors to arrive without their personal automobiles, thus relieving congestion on the roads.
- *Supply more bicycle racks.* Many units are accessible by bicycles; however, there must be adequate bicycle infrastructure on-site.
- *Decrease/waive entrance fees for those arriving using alternative transportation.* Visitors may be convinced to use alternative transportation if they will save money.
- *Promote use of off-site parking lot and shuttle visitors to site (or provide walking routes).* Off-site parking with either shuttles or walking access will contribute to a reduced number of vehicles on the roadways and at the parking lots within the site.
- *Encourage visitation to less congested areas.* Unit staff can encourage visitors to utilize less congested areas, which can make for a better visitor experience.
- *Warn visitors beforehand of expected delays (e.g., website, variable message signs).* Many outlets are available to inform visitors of delays before they arrive. These may signal alternatives.
- *Encourage graduated arrival/departure behavior.* Warning visitors about busy times and potential delays may induce a change in behavior that reduces overall congestion.
- *Conduct regular counts of unit traffic levels and communicate congestion information to visitors.* This data can help unit staff provide information to visitors about congestion.
- *Promote travel on under-utilized roads.* There may be multiple routes to help navigate a site. Maps and signage can help redistribute visitors along these under-utilized roads.
- *Improve bicycle infrastructure on unit roads.* Well-maintained bicycle infrastructure will increase the number of visitors able and wanting to access the unit by bicycle.
- *Improve bicycle infrastructure in nearby communities.* Units can and should work with nearby gateway communities to ensure that bicycle infrastructure outside of the site is maintained to a suitable level, and upgraded if necessary.

- *Provide showers and changing rooms for bicyclists.* Some visitors considering arrival by bicycle may be encouraged by the availability of showers and changing rooms.
- *Reservation system.* Reservation systems can help cap the number of visitors who will arrive at any given time.
- *Conduct tours, consolidating visitors.* Visitors may be interested in participating in staff-led tours. These tours can be held during off-peak hours.
- *Encourage visitors to pay cash or use passes.* If congestion at the entrance booth is a concern, then a separate lane may be provided for visitors with exact change or an annual pass to bypass the booth.
- *Allow visitors to print out passes online, to be scanned at the gate.* Pre-payment will reduce the amount of time each vehicle spends at the entrance booth, thus streamlining the entry process.

1 GOAL: Reduce traffic congestion							
	Strategy	Strategy Type	Modes	Cost	Staff Effort	Visitor Experience Impact	Environmental Impact
1.1	Reconfigure roads to one-way travel (loop)	Traffic Management /Tech	Car	Medium	Medium	Neutral	None or Low
1.2	Increase/decrease site entrance fee	Access Limitation	Car	Low	Low	Neutral	None or Low
1.3	Install graduated site entrance fee (e.g., lower fee before 9 AM, after 12 PM)	Access Limitation	Car	Low	Low	Neutral	None or Low
1.4	Supply more alternative transportation options to site	Traffic Management /Tech	Car	High	Medium	Positive	None or Low
1.5	Supply more bicycle racks	Alternative Access	Car	Low	Low	Positive	None or Low
1.6	Decrease/waive entrance fees for those arriving using alternative transportation	Access Limitation	Car	Low	Low	Neutral	None or Low
1.7	Promote use of off-site parking lot and shuttle visitors to site (or provide walking routes)	Alternative Access	Car	High	Medium	Neutral	Medium
1.8	Encourage visitation to less congested areas	Visitor Information	Car	Low	Low	Neutral	None or Low
1.9	Warn visitors beforehand of expected delays (e.g., website, variable message signs)	Visitor Information	Car	Low	Low	Positive	None or Low
1.10	Encourage graduated arrival/departure behavior	Visitor Information	Car	Low	Medium	Neutral	None or Low
1.11	Conduct regular counts of unit traffic levels and communicate congestion information to visitors	Visitor Information	Car	Low	Medium	Positive	None or Low
1.12	Promote travel on under-utilized roads	Visitor Information	Car	Low	Low	Neutral	None or Low
1.13	Improve bicycle infrastructure on unit roads	Alternative Access	Bike	Medium	Medium	Positive	None or Low
1.14	Improve bicycle infrastructure in nearby communities	Alternative Access	Bike	Medium	Medium	Positive	None or Low
1.15	Provide showers and changing rooms for bicyclists	Alternative Access	Bike	Medium	Medium	Positive	None or Low
1.16	Reservation system	Access Limitation	All	Medium	Medium	Neutral	None or Low
1.17	Conduct tours, consolidating visitors	Access Limitation, Alternative Access	All	Medium	Medium	Positive	None or Low
1.18	Encourage visitors to pay cash or use passes	Visitor Information	Car, Bike, Ped, Transit	Low	Low	Neutral	None or Low
1.19	Allow visitors to print out passes online, to be scanned at the gate	Technology	Car, Bike, Ped, Transit	Low	Low	Positive	None or Low

Goal 1: Reduce Traffic Congestion, Examples in Practice

Arches National Park, NPS

Goal: Reduce congestion at Fiery Furnaces

Strategy: Require permits or tour reservations

Arches National Park instituted a permit system in the early 2000s for hiking in the Fiery Furnaces area of Arches National Park, in response to extreme congestion at the site. Visitors can reserve a day-use hiking permit or a spot on a guided tour of the area. The passes can be purchased online.

For more information: <http://www.nps.gov/arch/index.htm>.⁸

Crater Lake, NPS

Goal: Provide information to visitors on traffic and road conditions at the park entrance and visitor center

Strategy: Set up webcams at entrance to the park to allow visitors to see the level of congestion or road conditions

Crater Lake National Park's roads can be difficult to access in snowy or icy conditions. The park has a webcam of the entrance and the visitor center on its website for visitors to assess conditions prior to their visit.

For more information: <http://www.nps.gov/crla/photosmultimedia/webcams.htm>.



Crater Lake webcams | Crater Lake National Park

Grand Canyon National Park, NPS

Goal: Reduce congestion at entrance booths

Strategy: Increase number of booths; create separate booths for passholders and shuttle buses

The Grand Canyon National Park reduced its congestion levels at the South Rim entrance gate by expanding the number of entrance booths and separating visitors who have pre-paid from visitors buying passes.

There is some private property within the park's boundaries. Residents of these areas have a sticker with an RFID tag on their cars which allows them to travel through the "fast lane" at the entrance booths.⁹

⁸ Conversation with Sabrina Henry and Anne Carson.

Grand Teton National Park

Goal: Reduce vehicular congestion at the park entrance

Strategy: Locate Visitor Center outside of the park entrance, employ visitor use assistants to answer questions in the line of cars; provide automated entry for nonmotorized access; waive fee in times of intense congestion



Automated pay machine on multi-use trail | Grand Teton National Park

Visitor Center Location

The Grand Teton Visitor Center is located outside of the park entrance. Visitors with questions or looking for information can stop at the visitor center prior to entering the park, reducing the amount of time spent at the entrance booth.

Separated lanes for passholders and non-passholders

There are three entrance lanes into the park – one for season passholders and employees, and the others for general visitors. Passholders swipe their passes at an automated card reader, which shortens the time to enter the park.

Multilingual visitor use assistants

Visitor Use Assistants walk among cars when there is an entrance queue, answering questions for visitors and directing visitors with annual passes to the fast pass lane.

Automated entrance for walkers and bikers

Grand Teton National Park installed automated fee booths for visitors entering the park by bicycle or on foot, arriving from an adjacent resort, or the nearby gateway communities. Previously, visitors purchased passes at the visitor center. Today, visitors now can walk up to the automated machine and quickly purchase a ticket to the park.

The separate entrance for bicyclists and pedestrians encourages nonmotorized use of the park, while still allowing the park to collect revenue from these visitors. It also allows staff at the visitor's center to focus on their interpretive services for visitors, rather than spending as much time processing entrance fees.

Waive fee in times of intense congestion

When backup at the entrance gates is most intense, park staff will open the entrance gates and allow visitors into the park without paying the entrance fee to save time.

⁹ Conversation with Maureen Ottogge.

Efficient striping in the parking lots

The park worked with the FHWA's Western Federal Lands Highway Division to redesign the striping in the parking lot to allow additional cars in the area. The restriping gave additional capacity at the parking lots without having to physically expand the lot size.

For more information: <http://www.nps.gov/grte/index.htm> or <http://gtnpnews.blogspot.com/2011/04/facility-opening-dates-for-2011-season.html>.¹⁰

Great Smoky Mountains, NPS

Goal: Encourage visitation at off-peak times

Strategy: Post visitation tips on park website, including suggested times of travel

Great Smoky Mountains National Park attracts about nine million visitors a year. To disperse the visitors among the park's many trails, park staff encourage visitors to use the lesser used trails or to travel during off-peak hours. The park has a website dedicated to tips to avoid crowds, and trains staff to encourage visitors to follow these tips to decrease congestion. The website cites specific peak days and hours, and markets the less popular trails as "places waiting to be explored" to highlight the value of these less-travelled trails.

For more information: <http://www.nps.gov/grsm/planyourvisit/avoidcrowds.htm>.

Little Sahara Recreation Area, BLM

Goal: Reduce traffic congestion at the entrance gates during peak periods

Strategy: Entrance booths in use only during peak periods

Little Sahara Recreation Area receives considerably more visitors on weekends than weekdays. During peak hours, visitors with passes or paying with cash can enter the park through two staffed entrance booths in addition to the visitor center. All people paying with a credit card are directed to the visitor center, while people with cash or passes can drive through the entrance booths. During non-peak hours, the entrance booths are closed, and all visitors drive to the visitor center and pay their entrance fee there. By only staffing the entrance booths during peak periods, Little Sahara Recreation Area can use staff more efficiently.

For more information:

http://www.blm.gov/ut/st/en/fo/fillmore/recreation/special_recreation/little_sahara_recreation.html or http://www.blm.gov/ut/st/en/info/newsroom/2009/april/blm_prepares_for_easter.html.

Sabino Canyon, Coronado National Forest, USFS

Goal: Reduce vehicular congestion

Strategy: Controlled vehicular access

Sabino Canyon, near Tucson, does not allow private automobiles within the site. Rather, visitors can hike or take a shuttle bus around the Canyon. The shuttle was put in place in the 1970s, as there was too much vehicular congestion in the site. Originally meant to serve as a basic transportation vehicle, now there is an interpretive feature on the shuttle that allows people the option to experience the site without getting out of the shuttle.

¹⁰ Conversation with Margaret Wilson and Terry Roper.

When congestion occurs, rangers at the entrance gates count the number of cars entering and allow cars into the site in a one-in, one-out basis.

For more information: <http://www.fs.fed.us/r3/coronado/forest/recreation/camping/sites/sabino.shtml>.¹¹

Shenandoah National Park, NPS

Goal: Provide park updates quickly to visitors

Strategy: Use Twitter as an additional way to announce park congestion or updates



Twitter site for Shenandoah National Park | Shenandoah National Park

Shenandoah National Park publishes important visitor information to a Twitter feed, which allows visitors to receive important information about park or trail conditions quickly on their mobile phones.

For more information: http://www.nps.gov/shen/playourvisit/entrance_fees.htm.

Statue of Liberty, NPS

Goal: Reduce visitor congestion inside the monument

Strategy: Timed Entry Passes

Tickets can be bought online and this helps to distribute the number of visitors over the course of a day. Visitors with pre-purchased tickets have priority entry to security check-in at the entrance.

¹¹ Conversation with Debby Kriegel, Sabino Canyon.

This tactic is not often used for an outdoor setting, but may be considered in areas of high visitation.

For more information: http://www.statueofliberty.org/Inside_the_statue.html.

Saint Gaudens NHS, NPS

Goal: Provide all basic and additional visitor and interpretive information in a single location.

Strategy: Mobile phone application with visitor information and maps



Saint Gaudens Web Application / Saint Gaudens National Historic Site

Saint Gaudens National Historic site offers an iPhone application (“app”) for visitors to tour the site. The app has audio tours, maps, and other visitor information. The Historic Site has iPhones with the pre-loaded app for rent at the Visitor Center. The app allows visitors to access wayfinding information within or outside of the Historic Site, making it useful for trip planning and wayfinding during the visit.

The application reduces the need for printed maps, and provides a richer, and more extensive interpretive experience than traditional maps and guides.

For more information: <http://www.nps.gov/saga/index.htm>.

Tongass National Forest, Mendenhall Glacier, USFS

Goal: Reduce congestion from tour buses at the visitor center

Strategy: Strategic bus arrival sequencing

Tongass National Forest worked with the Volpe Center to conduct a study to organize bus arrival sequence to the site’s visitor center. Prior to the study, the bus pick up and drop off area was crowded and unsafe to pedestrians. The organization of this area is intended to decrease congestion and increase efficiency at the site’s entrance as well as to improve visitor experience.

The forest is working on the implementation of the bus sequencing, as well as additional visitor access and congestion management strategies outlined in the report.¹²

¹² Conversation with Martha DeFreest.

Turtle Bay Exploration Park, California

Goal: Increase visitation during non-peak hours

Strategy: Reduce ticket price for mid-afternoon visitors

The Turtle Bay Exploration Park offers discounted admission for visitors arriving after 3:30 in the afternoon. This strategy is in place to provide an option for visitors who are unable to come for the entire day, as well as to increase visitation, but it may also serve as an incentive to disperse visitors to less busy periods of the day.

For more information: <http://www.turtlebay.org>.

Zilker Metropolitan Park, Austin, Texas

Goal: Encourage visitors to use park facilities during off-peak hours.

Strategy: Offer discounts on kayak rentals during off-peak hours.



Boat Coupon | Zilker Boats

Zilker Park in Austin, Texas, is a free city park along the Zilker River. It is a popular park for kayakers and frequently experiences congestion. Zilker Park Boat Rentals, the concessionaire for boat rentals offers a coupon for rentals prior to 12 PM, explicitly stating it is to encourage visitation during non-peak hours. By stating the purpose for the coupon, the concessionaire is both encouraging users to visit during non-peak hours to save money, and also informing visitors that there are congestion issues to consider.

For more information: <http://www.zilkerboats.com>.¹³

Canterbury Cathedral, United Kingdom

Goal: Prevent congestion at major viewing areas

Strategy: Move interpretive panels away from major viewing locations to reduce the congestion at key areas.

In Canterbury Cathedral, interpretation panels were removed from major viewing locations to reduce the congestion caused from reading the interpretive panel and viewing the key features of the cathedral. Cathedral staff members provide maps and guides to visitors, with the intention that visitors will read about the features ahead of time, or, at least, not in key viewing locations.¹⁴

¹³ Conversation with Scott Menzies, Zilker Park Boat Rentals, August 2011.

¹⁴ World Tourism Organization. *Tourism Congestion Management at National and Cultural Sites*. 2004.

Goal 2: Reduce Congestion in Parking Lots

Parking lots are often a source of congestion for federal land units. While some units have multiple attractions and therefore have cars spread out across multiple parking lots, many other units are characterized by a few select attractions, thus placing strain on a limited number of parking lots. There are several ways that a unit can combat congestion issues at parking lots. This can be done through a variety of strategies, including educating visitors, imposing restrictions, and conducting traffic engineering activities.

The following is a list of strategies for reducing congestion at parking lots, followed by a table evaluating the relative impacts and costs associated with implementing these respective strategies. This section concludes with a series of case studies demonstrating instances of these strategies in practice today at federal lands units.

- *Expand parking lot supply.* Increased supply may reduce congestion in the short-term; however, visitation may increase over the long-term.
- *Warn visitors beforehand of parking shortages (e.g., park webpage, Dynamic Message Signs).* Visitors made aware of parking shortages may choose to arrive at another time.
- *Restrict parking to vehicles with a minimum number of occupants.* Requiring multiple passengers per vehicle will reduce the overall number of vehicles accessing a site while not necessarily reducing the number of visitors.
- *Increase/decrease parking fee.* Fees can be adjusted upward in times of high parking lot utilization, and downward in times of lower utilization.
- *Promote use of off-site parking lot and shuttle visitors to site (or provide walking routes).* Off-site parking with either shuttles or walking access will contribute to a reduced number of vehicles on the roadways and at the parking lots within the site.
- *Conduct regular parking lot counts.* Frequent counts of parking lot capacity can assist a unit in understanding overall visitation patterns. In the near-term, this information may be able to be conveyed to visitors to encourage a change in their behavior.
- *Encourage visitation to under-utilized parking areas.* Some units have additional parking lots that may be a farther distance from the key attractions. However, if visitors are aware of these lots and are able to safely access them, they may be convinced to park there.
- *Improve visitor perception of safety and security at under-utilized parking areas.* Under-utilized parking lots may benefit from enhanced pedestrian access infrastructure and lighting to improve perceptions of safety and security. Presence of unit staff at these lots is also reassuring to visitors.
- *Provide adequate signage to parking areas.* Maps and signage are among the key contributors to visitor distribution throughout a site. Visitors must be made aware of all of their parking options so that they can make informed decisions that take into account possible congestion.
- *Provide clear informational signage about fee structures both at the entrance booth and further down the entrance road to allow visitors to prepare.* Backups at entrance booths are often due to a lack of visitor knowledge. Signage about fee structures should be provided in multiple locations as visitors approach the entrance booth, which cuts down on the time spent asking questions and looking for exact change.
- *Restripe parking lot for greater efficiency.* Drivers tend to be more cautious in poorly striped parking lots, which can reduce the efficiency with which vehicles can maneuver into and out of the lots. Restriping may improve these situations.

2 GOAL: Reduce congestion in parking lots								
	Strategy	Strategy Type	Modes	Cost	Staff Effort	Visitor Experience Impact	Environmental Impact	Examples
2.1	Expand parking lot supply	Traffic Management	Car	High	Medium	Neutral	Medium	
2.2	Warn visitors beforehand of parking shortages (e.g., park webpage, Dynamic Message Signs)	Visitor Information	Car	Low	Medium	Positive	None or Low	Muir Woods, Yosemite
2.3	Restrict parking to vehicles with a minimum number of occupants	Access Limitation	Car	Low	Low	Neutral	None or Low	
2.4	Increase/decrease parking fee	Access Limitation	Car	Medium	Medium	Neutral	None or Low	Yaquina Head
2.5	Promote use of off-site parking lot and shuttle visitors to site (or provide walking routes)	Visitor Information	Car	High	Medium	Neutral	Medium	Muir Woods
2.6	Conduct regular parking lot counts	Visitor Information	Car	Low	Medium	Positive	None or Low	Baxter State Park
2.7	Encourage visitation to under-utilized parking areas	Access Limitation, Visitor Information	Car	Low	Medium	Neutral	None or Low	Yosemite
2.8	Improve visitor perception of safety and security at under-utilized parking areas	Access Limitation, Visitor Information	Car	Medium	Medium	Positive	None or Low	
2.9	Provide adequate signage to parking areas	Visitor Information	Car	Low	Medium	Positive	None or Low	
2.10	Provide clear informational signage about fee structures both at the entrance booth and further down the entrance road to allow visitors to prepare	Visitor Information	Car, Bike, Ped, Transit	Low	Low	Positive	None or Low	Golden Gate National Recreation Area
2.11	Restripe parking lot for greater efficiency	Technology	Car	Low	Low	Neutral	None or Low	Grand Teton

Goal 2: Reduce Congestion in Parking Lots, Examples in Practice

Heart Lake, Adirondack Mountains New York

Goal: Encourage visitors to use overflow parking lot

Strategy: Charge for parking at main parking lots, but not at overflow locations

The Adirondack Mountain Club manages parking lots for Heart Lake and the Garden trailheads. These can get very busy in the summer, and are available for parking on a first-come, first-served basis. There is a charge for parking at the main parking lots; however, visitors can park for free in the overflow parking lots, and either take a shuttle from one of the parking lots to the trailheads, or use a less utilized trailhead from the overflow parking lot. The cost for parking is \$5, and the cost to ride the shuttle is \$3.

For more information: <http://www.adk.org/Hikes/TrailheadParkingInfo.aspx>.

Muir Woods National Monument, NPS

Goal: Allow access to visitors once parking lot and overflow parking were full.

Strategy: Install Variable Message Sign (VMS) to alert visitors to full parking lot and direct them to shuttle service



Variable Message Sign for Muir Woods Shuttle | Muir Woods National Monument

From 2005-2008, Muir Woods ran a pilot shuttle to help reduce strain on the parking lot and reduce illegal and overflow parking. The staff used changeable message signs with directions for the shuttle when the parking lot was full. Twenty-eight percent of visitors surveyed indicated that they chose to use the shuttle once they saw the sign and did not want to sit in traffic or fight congestion in the parking lots.

The shuttle is still in use and is popular. Ten to fifteen percent of visitors use the shuttle. The VMS is the number one reason people take the shuttle. Visitors can park alongside the road once the parking lot is full; however, parking along the road can spread a mile or longer from the site and visitors would prefer to take the shuttle. There is an additional fee for the shuttle. Some visitors are surprised or unhappy, but many think the fee is worth it. It is free to park in the lot when there is space. The shuttle is operated by Marin Transit.

There are two VMS signs for each direction of the highway – one announces that the lot is full and visitors should take the shuttle. The second is located closer to the exit to take for the shuttle, and lets people know to get off at that exit.

For more information: <http://trb.metapress.com/content/w127xn22061813m3/fulltext.pdf> or <http://www.nps.gov/muwo/index.htm>.¹⁵

¹⁵ Conversation with park staff.

Goal 3: Increase Efficient Use of Trails

Trails can be among a unit's most popular attractions, but they can also be dangerous when not managed properly. Trails may be made unsafe or otherwise difficult to navigate when they traverse rugged terrain, allow for multiple uses, or fall into a state of disrepair.

The following is a list of strategies for maintaining trails efficiently, followed by a table evaluating the relative impacts and costs associated with implementing these respective strategies. This section concludes with a series of case studies demonstrating instances of these strategies in practice today at federal lands units.

- *Widen trails to provide more space for use.* Wider trails will allow for more visitors to utilize them. On trails that allow bicycles, adding width can also make them safer and reduce conflicts between pedestrians and bicyclists.
- *Reconfigure trail for aesthetic purposes (e.g., better lookout points).* Reconfiguring trails to make for better lookout points contribute to an overall better visitor experience.
- *Reconfigure trail to connect with more popular visitor areas.* Enhancing a trail network to connect to multiple points of interest will make visitors more likely to utilize them.
- *Reconfigure existing trails to make them safer.* Trails may be difficult to navigate due to rough terrain or steep elevation changes. Reconfiguring them to make them more accessible may also make them safer.
- *Connect trail with one or more other trails.* Enhancing a trail to connect to other trails, thus establishing a network, will make visitors more likely to utilize them.
- *Provide informational material of trail locations and rules.* Visitors need to be made aware of the existence of trails, but also any rules that may either prevent them from utilizing them (e.g., age restrictions) or may increase their likelihood of utilizing them (e.g., bicycle restrictions may make pedestrians feel more safe).
- *Provide lighting and other effects which improve perception of safety.* The casual visitor may be unaccustomed to walking on trails. By providing lighting and other safety features, this casual visitor will feel more comfortable and will be more inclined to utilize the trail.

3 <i>GOAL: Increase efficient use of trails</i>								
	Strategy	Strategy Type	Modes	Cost	Staff Effort	Visitor Experience Impact	Environmental Impact	Examples
3.1	Widen trails to provide more space for use	Traffic Management / Technology	Bike, Ped	Medium	Medium	Positive	None or Low	
3.2	Reconfigure trail for aesthetic purposes (e.g., better lookout points)	Traffic Management / Technology	Bike, Ped	Medium	Medium	Positive	None or Low	
3.3	Reconfigure trail to connect with more popular visitor areas	Traffic Management / Technology	Bike, Ped	Medium	Medium	Positive	None or Low	
3.4	Reconfigure existing trails to make them safer	Traffic Management / Technology	Bike, Ped	Medium	Medium	Positive	None or Low	
3.5	Connect trail with one or more other trails	Traffic Management / Technology	Bike, Ped	Medium	Medium	Positive	None or Low	Mammoth Cave National Park
3.6	Provide informational material of trail locations and rules	Visitor Information	Bike, Ped	Low	Medium	Positive	None or Low	Golden Gate National Recreation Area, Saint Gaudens
3.7	Provide lighting and other effects which improve perception of safety	Traffic Management / Technology	Bike, Ped	Medium	Medium	Positive	Medium	

Goal 3: Increase Efficient Use of Trails, Examples in Practice

Inyo National Forest, USFS

Goal: Reduce congestion on Mount Whitney

Strategy: Implement a lottery-based reservation system

The forest limits the number of hikers on Mount Whitney to improve both safety and visitor experience. Hikers who want to use trails in the Mount Whitney area must apply for a Wilderness permit. The application period opens in the spring, with all spots announced in April. Additional permits are available at the forest for day-use hikers. In 2012, the lottery reservation system will be available online.

For more information: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5125183.pdf.

Yosemite National Park, Half Dome Trail, NPS

Goal: Maintain limit on dangerous trails to avoid accidents

Strategy: Impose permit system for hikers on summer weekends and holidays



Hikers on the Half Dome Trail | Yosemite National Park

The Half Dome trail in Yosemite is a unique, demanding trail that tends to get very crowded. The trail, which requires visitors to use cables to climb up a slab face of the Yosemite Half Dome, can become more dangerous as it gets more crowded.

Prompted by accidents on the trail related to crowded conditions, the park decided to limit the number of hikers on the trail by establishing a reservation system. Initially, the reservation system was limited to weekends; however, the

unit noticed that this simply moved the dangerous congested conditions to off-peak days. The reservation system is now in effect at all times.

Visitors can reserve a permit for the trail online, or call the park the day before hiking to inquire about unclaimed reservations. The park calculates a percentage of expected unclaimed reservations and provides these permits to visitors one day before the reservation. Permits are nonrefundable and nontransferable. Park Search and Rescue (PSAR) rangers collect the permits at the beginning of the trail.

Feedback for the system has generally been positive.

For more information: <http://www.nps.gov/yose/playourvisit/halfdome.htm>.

Golden Gate National Recreation Area, NPS

Goal: Reduce Visitor Confusion and encourage additional visitation in gateway communities

Strategy: Improve wayfinding plan and install signage at confusing intersections



Signage at Golden Gate National Recreation Area | Golden Gate National Recreation Area

Golden Gate National Recreation Area has an award-winning signage program that helps visitors navigate through the many trails within the units.

In 2005, the Parks Conservancy, National Park Service, and the Presidio Trust conducted a site assessment to identify opportunities to improve signage. NPS staff, trail experts, and frequent visitors walked through the site, looking for any intersections or areas that were confusing. The Conservancy used the results of this assessment as well as recorded complaints from visitors about confusing locations and developed a new signage plan for the units.

The signs identify trailheads, major destinations, activities and amenities of the sites, and distances between sites and markers. In addition to serving a wayfinding function, the trail signs can also increase visitor awareness of the multiple trails and amenities in the unit, encouraging exploration, and potentially increased visitor dispersion (thus reducing congestion on commonly used trails).

The National Parks Conservancy also has introduced the signs into nearby communities in San Francisco. One such sign is located near a YMCA about a mile from one of the unit entrances. The sign indicates that the unit is only a mile away and includes a map and transit directions from the YMCA.

The signage plan won design award in 2007 from the [Society for Environmental Graphic Design](#).

Future updates to the sign system may include additional information about trails, including the difficulty level, and potentially health messaging.

For more information: <http://www.parksconservancy.org/our-work/trails-forever/accomplishments/parkwide-way-finding-signage.html>.

Necedah National Wildlife Refuge, FWS

Goal: Enhance interpretation and visitation

Strategy: Guided night tours

Necedah National Wildlife Refuge offers night hikes as an additional way to access the refuge. The walks are led by refuge rangers in coordination with the refuge friends group.

For more information: <http://www.fws.gov/midwest/necedah/>.

Tallgrass Prairie National Preserve, NPS

Goal: Enhanced interpretation

Strategy: Audio guide



Audio guide sign | Tallgrass Prairie National Preserve

Tallgrass Prairie offers cell phone tours for a self-guided experience through the site. Visitors can dial the tour phone number from any phone, and enter in numbers from marked locations along the trails in the site. The audio content is also available to listen to online, which visitors can use for trip planning.

The cell phone tour helps direct visitors and can also manage to keep visitors on a regular schedule as they move through the site in order to help prevent congestion on the trails.

For more information: <http://www.nps.gov/tapr/photosmultimedia/cell-phone-tours.htm>.¹⁶

¹⁶ Conversation with Heather Brown.

Goal 4: Encouraging Use of Public Transportation or Nonmotorized Access

The availability of public transportation and nonmotorized means to access federal land units is commonly overlooked by visitors who are used to arriving at destinations in their personal automobiles. Promotional campaigns and incentives are two ways to encourage visitors to get out of their personal vehicles, which can enhance the visitor experience and reduce environmental degradation, in addition to enabling stronger visitor access management.

The following is a list of strategies for encouraging the use of public transportation and nonmotorized access, followed by a table evaluating the relative impacts and costs associated with implementing these respective strategies. This section concludes with a series of case studies demonstrating instances of these strategies in practice today at federal lands units.

- *Provide benches or seating areas at transit stops.* Benches will enhance comfort, which could increase use of public transportation.
- *Provide interpretive material on public transportation services.* Many visitors will be interested in any educational elements of a public transportation service.
- *Charge fees by party rather than by individual (benefits large families).* Large groups and families may be dissuaded from using public transportation if each individual must pay a fee.
- *Couple public transportation usage with other deals (e.g., coupons at local stores or site visitor shop).* Partnerships can contribute to bundled deals that increase use of public transportation.
- *Promote public transportation services at nearby tourist sites.* Information exchange at nearby attractions can contribute to an increased presence for a public transportation service.
- *Promote marketing effort of public transportation services.* Public transportation services, especially new ones, will benefit tremendously from an effective marketing campaign to get the word out.
- *Adequately inform visitors of any service delays.* There are many mechanisms through which visitors could potentially receive information about delays. Unit staff need to be utilizing these technologies.
- *Increase/decrease parking fee.* Parking fees can be adjusted (generally upward) to encourage use of public transportation. They may be lowered in locations where visitors can access the public transportation, such as “park-and-ride” lots.
- *Provide in-vehicle electronic information (e.g., stop announcement).* Special features on public transportation services make them more appealing to visitors.
- *Install automatic vehicle locators (AVLs) on shuttle vehicles.* This technology can allow for information to be easily transmitted to visitors about the exact location of shuttle vehicles, thus enabling potential riders to better plan their visit and maximize their time.
- *Allow visitors to purchase tickets prior to boarding.* Enabling visitors to purchase tickets in advance will quicken the boarding process and reduce travel times.
- *Remove pay-as-you-board policies.* Providing a pass that allows visitors to utilize a public transportation service for the duration of a day or a season, rather than paying a fee for each usage, will speed the boarding process and may make visitors more inclined to use the service.

4 <i>GOAL: Encourage use of public transportation or nonmotorized access</i>								
	Strategy	Strategy Type	Modes	Cost	Staff Effort	Visitor Experience Impact	Environmental Impact	Examples
4.1	Provide benches or seating areas at transit stops	Traffic Management / Technology	Transit	Low	Medium	Positive	None or Low	
4.2	Provide interpretive material on public transportation services	Visitor Information	Transit	Low	Medium	Positive	None or Low	
4.3	Charge fees by party rather than by individual (benefits large families)	Access Limitation	Transit	Low	Medium	Neutral	None or Low	
4.4	Couple public transportation usage with other deals (e.g., coupons at local stores or site visitor shop)	Visitor Information	Transit	Low	Medium	Positive	None or Low	Cuyahoga Valley National Park
4.5	Promote public transportation services at nearby tourist sites	Visitor Information	Transit	Low	Medium	Positive	None or Low	Golden Gate National Recreation Area
4.6	Promote marketing effort of public transportation services	Visitor Information	Transit	Low	Medium	Positive	None or Low	
4.7	Adequately inform visitors of any service delays	Visitor Information	Transit	Low	Medium	Positive	None or Low	
4.8	Increase/decrease parking fee	Access Limitation	Transit	Low	Medium	Neutral	None or Low	
4.9	Provide in-vehicle electronic information (e.g., stop annunciation)	Visitor Information	Transit	Low	Medium	Positive	None or Low	
4.10	Install automatic vehicle locators (AVLs) on shuttle vehicles	Visitor Information	Transit	Low	Medium	Positive	None or Low	
4.11	Allow visitors to purchase tickets prior to boarding	Traffic Management / Technology	Transit	Low	Medium	Neutral	None or Low	
4.12	Remove pay-as-you-board policies	Traffic Management / Technology	Transit	Low	Medium	Neutral	None or Low	

Goal 4: Encouraging Use of Public Transportation or Nonmotorized Access, Examples in Practice

Aztec Ruins National Monument, NPS

Goal: Encourage visitation to the monument

Strategy: Develop a walking trail between the monument and the historic district of a gateway community

Aztec National Monument, unlike many of the other case studies in this report, has not had a congestion problem. Rather, the monument is seeking to increase visitation to the site. The site is difficult to reach without a car, despite its close proximity to the town of Aztec.

To increase overall visitation, reduce potential pressure on parking facilities, and encourage active transportation, the unit is planning a multi-use trail connecting the historic center of Aztec, the unit's gateway community, and the unit's visitor center.

The multi-use trail is planned to feature designs reflecting the historic nature of the site and will have entrance signs that serve both a wayfinding and promotional function.

For more information: <http://www.nps.gov/azru/planyourvisit/index.htm>.

Cuyahoga Valley National Park, NPS

Goal: Encourage nonmotorized transit in the unit

Strategy: Coordinate with scenic railroad to allow bikes on the train



Visitors loading bicycles onto the scenic train | Cuyahoga Valley National Park

Cuyahoga Valley has several multi-use paths for biking and hiking, as well as paths specifically designated for hikers. The paths run through much of the 33,000 acres. The “Bike Aboard” program encourages visitors to use the bicycling trails in conjunction with the scenic railroad. Bikers can bike along the Ohio and Erie Canal Towpath Trail and then ride the train back to the entrance or visitor center.

The program is promoted by the unit, the scenic railroad, and the nearby bicycle rental concessionaires, and it has exceeded ridership expectations.

For more information: <http://www.nps.gov/cuva/planyourvisit/bicyclinginformation.htm>.

Gateway National Recreation Area

Goal: Encourage use of public transit

Strategy: Charge fee for parking, but not for admission

Sandy Hook, part of the Gateway National Recreation Area, has no entrance fees. However, from Memorial Day weekend to Labor Day a \$10 Beach Parking Fee is charged from 7 AM to 4 PM at Sandy Hook. The unit is accessible by public transportation.

Shenandoah National Park, NPS

Goal: Encourage nonmotorized access

Strategy: Cap the entrance fee for families travelling without a vehicle so not to penalize nonmotorized access

While the vast majority of visitors entering Shenandoah National Park arrive by automobile, the unit still wanted to ensure there was incentive to use a nonmotorized means of access.

Shenandoah charges \$15 per private vehicle and \$8 per individual arriving without a private vehicle, with the stipulation that a family traveling together without the use of a private vehicle will not pay more than \$15.

For more information: http://www.nps.gov/shen/playourvisit/entrance_fees.htm.

Yaquina Head Outstanding Natural Area, BLM

Goal: Encourage walking and biking

Strategy: Charge for parking, not for admission



Paths leading to the Yaquina Head Lighthouse | Yaquina Head Outstanding Natural Area

Yaquina Head Outstanding Natural Area has suffered vehicular congestion, especially in the parking lot adjacent to the Yaquina Head Lighthouse, the main built feature of the natural area.

The natural area is accessible by public transportation (a city bus) and bike and walking trails. To encourage biking, walking, and use of public transit, the staff at the natural area charges a fee only for parking, while entrance to the site itself is free.

The natural area conducted an analysis in conjunction with the Volpe Center in 2008, which advised a series of strategies to reduce vehicular congestion, including limiting vehicular access in the natural area, improving signage and landscaping to encourage walking and biking, and using staff to encourage visitors to use alternative transportation to and around the site. The unit has since been evaluating these strategies.

For more information: <http://www.blm.gov/or/resources/recreation/yaquina/index.php>.

Croton Point Park, Westchester County, New York

Goal: Encourage public transit use to the unit

Strategy: Charge for parking, not park admission

Croton Point Park, owned by Westchester County in New York, encourages the use of public transit to get to the unit. Admission to the park is free; however, there is a separate \$5 fee for parking.

Visitors can access the park via Amtrak or Metro-North commuter rail service, and either walk to the park from the station, or ride one of the free shuttle buses. Extra shuttle buses are in service during special events.

For more information:

http://parks.westchestergov.com/index.php?option=com_content&task=view&id=2567&Itemid=4500.

Goal 5: Reducing Conflicts Among Visitors

Federal land units are accessible through a variety of modes of transportation, which allows for a diversity of activities. It can at times be difficult to manage the interactions among visitors who may be traveling at high rates of speeds and utilizing dangerous types of vehicles (e.g., cars, boats, bicycles). To make matters more difficult to manage, both visitors and unit staff must account potential interactions with vulnerable pedestrians.

The following is a list of strategies for reducing conflicts among visitors, followed by a table evaluating the relative impacts and costs associated with implementing these respective strategies. This section concludes with a series of case studies demonstrating instances of these strategies in practice today at federal lands units.

- *Design facilities to channel specific visitor activities (e.g., a boat launch).* Many activities require an investment in facilities to accommodate them, such as changing rooms and showers at beaches, if they are to be utilized.
- *Outline visitor use regulations through signage and in informational material.* Visitors should be made aware of any regulations as far in advance as possible, so that they may plan accordingly.
- *Widen trails for ADA-accessibility, and to reduce conflict where users congregate (lookout points).* Widening trails not only makes them ADA-accessible, but also reduces the likelihood of visitors encroaching on each other's space.
- *Provide physical barriers to facilitate two-way access (e.g., fencing, posts).* Facilities with two-way access require clear delineation of direction.
- *Provide physical barriers between different user types (e.g., bikers vs. walkers).* Visitors who may, for example, be moving at various rates of speed may require their own facilities.
- *Paint lines on trails to mark usage conditions.* Markings can very easily denote usage conditions at low cost.
- *Install traffic calming elements, such as rotaries or chicanes.* Both on roadways and trails, traffic calming elements can reduce speeds and increase safety.
- *Install a bike-ped lane.* Separating uses for vehicles, and bicycles and pedestrians, will increase safety and allow for increased mobility within a site.
- *Re-stripe roads to allow for passing of slower vehicles.* Especially at federal lands units with scenic views, vehicles may operate at different speeds even within the parameters of a given speed limit. Allowing for slower vehicles to be passed can increase safety and contribute to a more enjoyable visitor experience.

5 GOAL : Reduce conflicts among visitors								
	Strategy	Strategy Type	Modes	Cost	Staff Effort	Visitor Experience Impact	Environmental Impact	Examples
5.1	Design facilities to channel specific visitor activities (e.g., a boat launch)	Access Limitation	Bike, Car, Ped, Transit	Medium	Medium	Positive	Medium	
5.2	Outline visitor use regulations through signage and in informational material	Visitor Information	Bike, Car, Ped, Transit	Low	Low	Positive	None or Low	
5.3	Widen trails for ADA-accessibility, and to reduce conflict where users congregate (lookout points)	Traffic Management / Tech	Bike, Car, Ped, Transit	Medium	Medium	Positive	Medium	
5.4	Provide physical barriers to facilitate two-way access (e.g., fencing, posts)	Traffic Management / Tech	Bike, Car, Ped, Transit	Medium	Medium	Neutral	Medium	
5.5	Provide physical barriers between different user types (e.g., bikers vs. walkers)	Traffic Management / Tech	Bike, Car, Ped, Transit	Medium	Medium	Neutral	Medium	Grant Teton National Park
5.6	Paint lines on trails to mark usage conditions	Traffic Management / Tech	Bike, Car, Ped, Transit	Low	Low	Neutral	None or Low	
5.7	Install traffic calming elements, such as rotaries or chicanes	Traffic Management / Tech	Bike, Car, Ped, Transit	Medium	Medium	Positive	None or Low	Mary Carter Greenway
5.8	Install a bike-ped lane	Traffic Management / Tech	Bike, Ped	Medium	Medium	Positive	None or Low	
5.9	Re-stripe roads to allow for passing of slower vehicles	Traffic Management / Tech	Bike, Car, Ped, Transit	Low	Low	Neutral	None or Low	

Goal 5: Reducing Conflicts Among Visitors, Examples in Practice

Grand Canyon National Park, NPS

Goal: Reduce vehicular traffic along the Grand Canyon

Strategy: Develop nonmotorized trails in certain areas

Grand Canyon experiences significant vehicular congestion in the parking lots, at the entrance gates and on the roads themselves. To help mitigate this congestion, Grand Canyon staff encourages visitors to walk, bike, or take a shuttle around the canyon.

Bike and pedestrian greenways are closed to automobile traffic, making it safe and easy to access the unit by walking or biking. Because the Grand Canyon covers a wide area, visitors that want to see many features may choose to bike or take the free shuttle buses.

Bright Angel, the bicycle concessionaire at the Grand Canyon, offers bicycle rentals for touring the unit, as well as bicycle tours. The concessionaire produces a guide for biking trails in the Grand Canyon, with details such as mileage, approximate travel time, elevation change, proximity to shuttle stops, and suggested users.

For more information: <http://www.bikegrandcanyon.com/map/grandcanyonbikemap.pdf>.



Bright Angel website with map and trail descriptions | Bright Angel

Grand Canyon National Park, NPS

Goal: Reduce employee use of automobiles in the unit

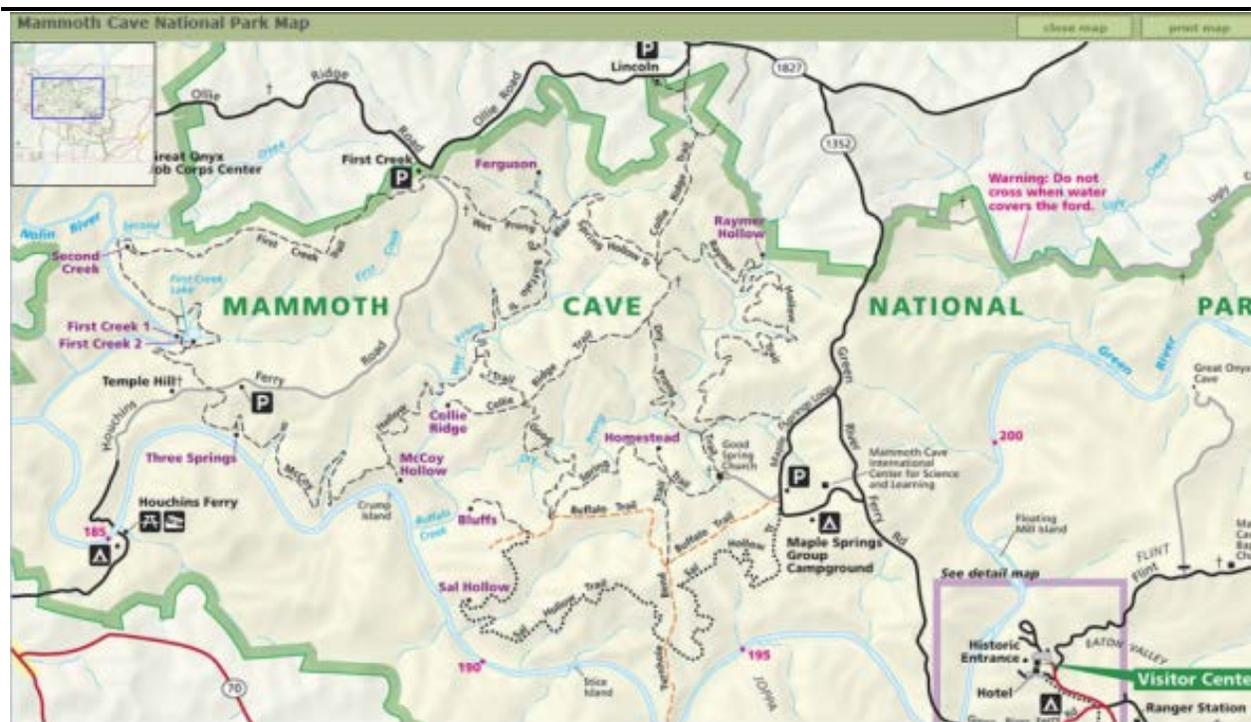
Strategy: Implement an employee bike sharing program

The Grand Canyon is working on an employee bike sharing program within the unit boundaries. As of 2011, the unit has purchased bicycles and is finalizing details of the program. Employees would be able to sign out a bicycle to get around the unit, reducing automobile traffic.¹⁷

Mammoth Cave National Park, NPS

Goal: Encourage nonmotorized access for users with varying abilities and interests

Strategy: Develop dense network multi-use trails with several entry points



Mammoth Cave National Park Map | Mammoth Cave National Park

Mammoth Cave National Park has several trails for biking and hiking, which are configured in a dense network with several access points and intersections to allow visitors to customize an appropriate trip for their mode and ability. There are some restrictions on mode (some trails do not allow cyclists or horses).

By creating several entry points, visitors have more control over their trail experience, as they can customize their trip path. Visitors also have increased opportunities to make decisions about their visit while on the trails, as they can change their paths at most of the intersections. A dense network of trails with many intersections follows the same connectivity principles in an urban setting, and can be beneficial to the visitor; however, this type of network segments the natural areas and habitats of local or migratory species and may not always be the best option for a public land.

¹⁷ Conversation with Maureen Ottogge.

For more information: <http://www.nps.gov/mac/index.htm>.¹⁸

Santa Ana National Wildlife Refuge, FWS

Goal: Improve visitor access and interpretive experience

Strategy: Partner with friends group to offer guided tours around the refuge



Santa Ana Refuge Guided Tours | Santa Ana National Wildlife Refuge

Santa Ana has a wildlife paved road open to vehicles during the summer months. In winter months, the refuge offers ranger-led tram tours to allow visitors access throughout the site.

For more information: <http://www.friendsofsouthtexasrefuges.org/?id=223>.

Mary Carter Greenway, South Suburban Parks and Recreation District, CO

Goal: Reduce conflicts between bicyclists and pedestrians at intersections on a multi-use trail

Strategy: Implement traffic circles to slow bicycle speeds



Mary Carter Greenway Bicycle Circles | Mary Carter Greenway

The Mary Carter Greenway is heavily used by both bicyclists and pedestrians. The Greenway has installed bicycle traffic circles in order to help reduce bicycle speeds to reduce conflicts between users.

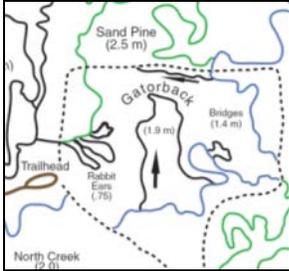
For more information: <http://www.americantrails.org/resources/ManageMaintain/ManageMCSeans.html>

¹⁸ Conversation with Vickie Carson.

Alafia River State Park – Brandon, Florida

Goal: Improve safety on biking trails

Strategy: Restrict bikers to travelling one-way on certain trails



Alafia River State Park Map | Alafia River State Park

Alafia River State Park has trails for bikers, hikers, and horses. Two of the trails are advanced trails for cyclists and the unit restricts the direction of bike travel to ensure visitor safety. The unit has several other trails designated for multi-use.

For more information: <http://www.sarasota-florida.org/biking-daytrips.html>.¹⁹

¹⁹ Conversation with park staff.

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14. ABSTRACT This visitor access and transportation guide presents opportunities to manage or improve circulation and travel patterns in areas managed by Federal Land Management Agencies (FLMAs). Transportation is only one element of visitor use management and should be considered in conjunction with cultural and environmental resource protection objectives and comprehensive long-range plans. Transportation strategies may both conventional transportation infrastructure as well as alternative transportation systems, such as shuttle bus systems. Depending on the circumstances of individual units, however, small-scale strategies, such as improvements at site entrances and visitor stations, and along roadways, parking areas, trailheads, and pull-offs, may be better suited to address specific visitor use management needs. This guide provides examples of transportation strategies that vary in cost, scale, and transportation need as well as the lessons learned from past applications of different transportation measures. Through the implementation of these strategies, land managers may avoid or defer the expense and time commitment required for a large infrastructure project.					
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